The following worksheets, listed below, present calculations for the Prong 1 variability analysis, by similar source based on combining the approaches from EPA in the 2004 proposed Utility MACT and the NACAA 112j Industrial Boiler Model Rule. Prong 1 is described in more detail in the Pee Dee Case-by-Case MACT Permit Application.

Prong 1 Worksheets:

P1 Cross 1
P1 Cross 2

Cross 1

Scope: The purpose of the spreadsheet calculations on this tab is to re-create the variability analysis performed by EPA when determining the MACT floor for Mercury Emissions in the Proposed Utility MACT, dated January 30, 2004 (69 FR 4652). This worksheet is formatted to resemble the tables in EPA-HQ-OAR-2002-0056-0006[1].pdf of the Utility MACT Docket. While this unit was not specifically addressed in EPA's variability analysis (EPA only reviewed the top 4 sources before applying variability), this worksheet applies EPA's same analysis by defining a process control variability equation (with values for alpha and beta) and applying this equation to coal samples that could have been combusted by the unit to incorporate fuel variability.

Note: EPA's analysis did not address process control variability for sources where the mercury removal associated with the control configuration utilized could not be attributed to the chlorine content of the coal (see ENSR/WEST Associates Chlorine Algorithms). The analysis shown here includes process control variability through using a value for Beta that represents the 97.5% Confidence Interval mercury removal rate estimated from the individual stack test runs in the ICR-3 database.

Coal Sampling Data from Facility Data				Fuel Variability Calculations		97.5th Percentile Calculations		
Date	Heat Input (Btu/lb)	Mercury Concentration (ppm)	Chlorine Concentration (ppm)	Mercury Removal Fraction, Fr [1, 3] (unitless)	Controlled Mercury Emission Level, E [2] (lb Hg/TBtu)	Cumulative Frequency	Index	Sorted E (lb Hg/Tbtu)
01/07/08	12,500	0.102		0.8563	1.1729	0.006	1	0.2875
01/31/08	12,500	0.089		0.8563	1.0234	0.013	2	0.5634
02/07/08	12,500	0.077		0.8563	0.8854	0.019	3	0.5864
02/14/08	12,500	0.136		0.8563	1.5639	0.026	4	0.5979
02/22/08	12,500	0.141		0.8563	1.6213	0.032	5	0.6324
02/29/08	12,500	0.087		0.8563	1.0004	0.039	6	0.7704
03/14/08	12,500	0.117		0.8563	1.3454	0.045	7	0.7934
05/07/08	12,500	0.089	940	0.8563	1.0234	0.052	8	0.7934
05/14/08	12,500	0.108	872	0.8563	1.2419	0.058	9	0.8394
05/21/08	12,500	0.094	914	0.8563	1.0809	0.065	10	0.8854
05/31/08	12,500	0.108	1,028	0.8563	1.2419	0.071	11	0.8854
06/07/08	12,500	0.103	1,150	0.8563	1.1844	0.078	12	0.8854
06/14/08	12,500	0.112	904	0.8563	1.2879	0.084	13	0.8854
01/07/08	12,500	0.102		0.8563	1.1729	0.091	14	0.8969
01/31/08	12,500	0.091		0.8563	1.0464	0.097	15	0.9084
02/07/08	12,500	0.073		0.8563	0.8394	0.104	16	0.9314
02/14/08	12,500	0.130		0.8563	1.4949	0.110	17	0.9314
02/22/08	12,500	0.117		0.8563	1.3454	0.117	18	0.9429
02/29/08	12,500	0.079		0.8563	0.9084	0.123	19	0.9659
03/14/08	12,500	0.112		0.8563	1.2879	0.130	20	0.9774
03/21/08	12,500	0.124		0.8563	1.4259	0.136	21	0.9774
03/31/08	12,500	0.092		0.8563	1.0579	0.143	22	1.0004
04/07/08	12,500	0.095		0.8563	1.0924	0.149	23	1.0004
04/14/08	12,500	0.099		0.8563	1.1384	0.156	24	1.0119
04/21/08	12,500	0.104		0.8563	1.1959	0.162	25	1.0234
04/30/08	12,500	0.109		0.8563	1.2534	0.169	26	1.0234
05/07/08	12,500	0.107		0.8563	1.2304	0.175	27	1.0234
05/14/08	12,500	0.120		0.8563	1.3799	0.182	28	1.0234
05/21/08	12,500	0.102		0.8563	1.1729	0.188	29	1.0234
05/31/08	12,500	0.130		0.8563	1.4949	0.195	30	1.0349
06/07/08	12,500	0.092		0.8563	1.0579	0.201	31	1.0464
06/14/08	12,500	0.121		0.8563	1.3914	0.208	32	1.0579
01/07/08	12,500	0.135		0.8563	1.5524	0.214	33	1.0579
01/31/08	12,500	0.104		0.8563	1.1959	0.221	34	1.0694
02/07/08	12,500	0.085		0.8563	0.9774	0.227	35	1.0809
02/14/08	12,500	0.134		0.8563	1.5409	0.234	36	1.0924
02/22/08	12,500	0.096		0.8563	1.1039	0.240	37	1.0924
02/29/08	12,500	0.084		0.8563	0.9659	0.247	38	1.0924
03/14/08	12,500	0.115		0.8563	1.3224	0.253	39	1.1039
03/21/08	12,500	0.105		0.8563	1.2074	0.260	40	1.1039
03/31/08	12,500	0.107		0.8563	1.2304	0.266	41	1.1039
04/07/08	12,500	0.112		0.8563	1.2879	0.273	42	1.1039
04/14/08	12,500	0.112		0.8563	1.2879	0.279	43	1.1154
04/21/08	12,500	0.098		0.8563	1.1269	0.286	44	1.1269
04/30/08	12,500	0.111		0.8563	1.2764	0.292	45	1.1269
05/07/08	12,500	0.088		0.8563	1.0119	0.299	46	1.1384
05/14/08	12,500	0.100		0.8563	1.1499	0.305	47	1.1384
05/21/08	12,500	0.102		0.8563	1.1729	0.312	48	1.1499
05/31/08	12,500	0.118		0.8563	1.3569	0.318	49	1.1499
06/07/08	12,500	0.093		0.8563	1.0694	0.325	50	1.1614
06/14/08	12,500	0.142		0.8563	1.6328	0.331	51	1.1614
01/07/08	12,500	0.077		0.8563	0.8854	0.338	52	1.1614
01/31/08	12,500	0.096		0.8563	1.1039	0.344	53	1.1614

02/07/08	12,500	0.077	0.8563	0.8854	0.351	54	1.1729
02/14/08	12,500	0.128	0.8563	1.4719	0.357	55	1.1729
02/21/08	12,500	0.108	0.8563	1.2419	0.364	56	1.1729
02/29/08	12,500	0.108	0.8563	1.2419	0.370	57	1.1729
03/14/08	12,500	0.102	0.8563	1.1729	0.377	58	1.1729
03/21/08	12,500	0.089	0.8563	1.0234	0.383	59	1.1729
03/31/08	12,500	0.121	0.8563	1.3914	0.390	60	1.1729
04/07/08	12,500	0.096	0.8563	1.1039	0.396	61	1.1844
04/14/08	12,500	0.096	0.8563	1.1039	0.403	62	1.1959
04/21/08	12,500	0.111	0.8563	1.2764	0.409	63	1.1959
04/30/08	12,500	0.113	0.8563	1.2994	0.416	64	1.1959
05/07/08	12,500	0.106	0.8563	1.2189	0.422	65	1.2074
05/14/08	12,500	0.110	0.8563	1.2649	0.429	66	1.2189
05/21/08	12,500	0.120	0.8563	1.3799	0.435	67	1.2189
05/31/08	12,500	0.158	0.8563	1.8168	0.442	68	1.2189
06/07/08	12,500	0.106	0.8563	1.2189	0.448	69	1.2304
06/14/08	12,500	0.098	0.8563	1.1269	0.455	70	1.2304
01/07/08	12,500	0.101	0.8563	1.1614	0.461	71	1.2304
01/14/08	12,500	0.123	0.8563	1.4144	0.468	72	1.2304
01/31/08	12,500	0.112	0.8563	1.2879	0.474	73	1.2419
02/07/08	12,500	0.055	0.8563	0.6324	0.481	74	1.2419
02/14/08	12,500	0.117	0.8563	1.3454	0.487	75	1.2419
02/21/08	12,500	0.114	0.8563	1.3109	0.494	76	1.2419
02/29/08	12,500	0.095	0.8563	1.0924	0.500	77	1.2419
03/07/08	12,500	0.121	0.8563	1.3914	0.506	78	1.2419
03/14/08	12,500	0.152	0.8563	1.7478	0.513	79	1.2419
03/21/08	12,500	0.119	0.8563	1.3684	0.519	80	1.2534
03/31/08	12,500	0.108	0.8563	1.2419	0.526	81	1.2534
04/07/08	12,500	0.116	0.8563	1.3339	0.532	82	1.2649
04/14/08	12,500	0.102	0.8563	1.1729	0.539	83	1.2764
04/21/08	12,500	0.101	0.8563	1.1614	0.545	84	1.2764
04/30/08	12,500	0.081	0.8563	0.9314	0.552	85	1.2764
05/07/08	12,500	0.097	0.8563	1.1154	0.558	86	1.2879
05/14/08	12,500	0.069	0.8563	0.7934	0.565	87	1.2879
05/21/08	12,500	0.069	0.8563	0.7934	0.571	88	1.2879
05/31/08	12,500	0.089	0.8563	1.0234	0.578	89	1.2879
06/07/08	12,500	0.095	0.8563	1.0924	0.584	90	1.2879
06/14/08	12,500	0.099	0.8563	1.1384	0.591	91	1.2994
01/07/08	12,500	0.176	0.8563	2.0238	0.597	92	1.2994
01/14/08	12,500	0.052	0.8563	0.5979	0.604	93	1.3109
01/31/08	12,500	0.154	0.8563	1.7708	0.610	94	1.3224
02/07/08	12,500	0.140	0.8563	1.6098	0.617	95	1.3339
02/14/08	12,500	0.128	0.8563	1.4719	0.623	96	1.3454
02/22/08	12,500	0.153	0.8563	1.7593	0.630	97	1.3454
02/29/08	12,500	0.100	0.8563	1.1499	0.636	98	1.3454
03/07/08	12,500	0.132	0.8563	1.5179	0.643	99	1.3569
03/14/08	12,500	0.126	0.8563	1.4489	0.649	100	1.3569
03/21/08	12,500	0.170	0.8563	1.9548	0.656	101	1.3569
03/31/08	12,500	0.106	0.8563	1.2189	0.662	102	1.3684
04/07/08	12,500	0.108	0.8563	1.2419	0.669	103	1.3684
04/14/08	12,500	0.134	0.8563	1.5409	0.675	104	1.3684
04/21/08	12,500	0.118	0.8563	1.3569	0.682	105	1.3684
04/30/08	12,500	0.186	0.8563	2.1388	0.688	106	1.3799
05/07/08	12,500	0.152	0.8563	1.7478	0.695	107	1.3799
05/14/08	12,500	0.146	0.8563	1.6788	0.701	108	1.3914
05/21/08	12,500	0.119	0.8563	1.3684	0.708	109	1.3914
05/31/08	12,500	0.140	0.8563	1.6098	0.714	110	1.3914
06/07/08	12,500	0.128	0.8563	1.4719	0.721	111	1.4144
06/14/08	12,500	0.119	0.8563	1.3684	0.727	112	1.4144
01/07/08	12,500	0.108	0.8563	1.2419	0.734	113	1.4259
01/14/08	12,500	0.049	0.8563	0.5634	0.740	114	1.4489
01/31/08	12,500	0.101	0.8563	1.1614	0.747	115	1.4489
02/07/08	12,500	0.126	0.8563	1.4489	0.753	116	1.4489
02/14/08	12,500	0.154	0.8563	1.7708	0.760	117	1.4719
02/22/08	12,500	0.101	0.8563	1.1614	0.766	118	1.4719
02/29/08	12,500	0.140	0.8563	1.6098	0.773	119	1.4719
03/07/08	12,500	0.111	0.8563	1.2764	0.779	120	1.4719
03/14/08	12,500	0.143	0.8563	1.6443	0.786	121	1.4949
03/21/08	12,500	0.186	0.8563	2.1388	0.792	122	1.4949
03/31/08	12,500	0.119	0.8563	1.3684	0.799	123	1.4949

04/07/08	12,500	0.144	0.8563	1.6558	0.805	124	1.4949
04/14/08	12,500	0.107	0.8563	1.2304	0.812	125	1.5064
04/21/08	12,500	0.128	0.8563	1.4719	0.818	126	1.5179
04/30/08	12,500	0.118	0.8563	1.3569	0.825	127	1.5179
05/07/08	12,500	0.126	0.8563	1.4489	0.831	128	1.5409
05/14/08	12,500	0.140	0.8563	1.6098	0.838	129	1.5409
05/21/08	12,500	0.146	0.8563	1.6788	0.844	130	1.5524
05/31/08	12,500	0.152	0.8563	1.7478	0.851	131	1.5639
06/07/08	12,500	0.131	0.8563	1.5064	0.857	132	1.6098
06/14/08	12,500	0.130	0.8563	1.4949	0.864	133	1.6098
01/07/08	12,500	0.089	0.8563	1.0234	0.870	134	1.6098
01/14/08	12,500	0.025	0.8563	0.2875	0.877	135	1.6098
01/31/08	12,500	0.051	0.8563	0.5864	0.883	136	1.6213
02/07/08	12,500	0.077	0.8563	0.8854	0.890	137	1.6328
02/14/08	12,500	0.087	0.8563	1.0004	0.896	138	1.6443
02/22/08	12,500	0.146	0.8563	1.6788	0.903	139	1.6558
02/29/08	12,500	0.109	0.8563	1.2534	0.909	140	1.6788
03/07/08	12,500	0.132	0.8563	1.5179	0.916	141	1.6788
03/14/08	12,500	0.157	0.8563	1.8053	0.922	142	1.6788
03/21/08	12,500	0.104	0.8563	1.1959	0.929	143	1.7478
03/31/08	12,500	0.102	0.8563	1.1729	0.935	144	1.7478
04/07/08	12,500	0.107	0.8563	1.2304	0.942	145	1.7478
04/14/08	12,500	0.067	0.8563	0.7704	0.948	146	1.7593
04/21/08	12,500	0.081	0.8563	0.9314	0.955	147	1.7708
04/30/08	12,500	0.130	0.8563	1.4949	0.961	148	1.7708
05/07/08	12,500	0.113	0.8563	1.2994	0.968	149	1.8053
05/14/08	12,500	0.078	0.8563	0.8969	0.974	150	1.8168
05/21/08	12,500	0.090	0.8563	1.0349	0.981	151	1.9548
05/31/08	12,500	0.123	0.8563	1.4144	0.987	152	2.0238
06/07/08	12,500	0.082	0.8563	0.9429	0.994	153	2.1388
06/14/08	12,500	0.085	0.8563	0.9774	1.000	154	2.1388

Calculation of 97.5th Percentile

Cumulative Frequency	Index	Sorted E (lb Hg/Tbtu)	97.5th Percentile
0.974	150	1.8168	1.8375
0.981	151	1.9548	

[1] The equation for Fr is as follows: $Fr = 1 - \beta e^{(-\alpha * Cl)}$

where: $\beta = e^{-b}$

$\alpha = a$

a = slope of least-squares fit
b = y-intercept of least-squares fit
Cl = Chlorine concentration, ppm
Fr = fraction of mercury removed during stack test

[2] The equation for E is as follows: $E = \frac{10^6 * Hg(1 - Fr)}{H}$

where: Hg = Mercury concentration, ppm
H = Heat input, Btu/lb
E = Controlled mercury emission level, lb Hg/Tbtu

[3] The following values were used in the Fr equation:
Alpha: 0
Beta: 0.1437

References:

1 Alpha and Beta were referenced from the tab 'Hg Existing & New MACT Limit' in EPA-HQ-OAR-2002-0056-0035(1).xls, which is found in the Utility MACT Docket AOR-2002-0056.
2 Alpha and Beta represent the coefficients in the curve of best fit, developed by EPA to predict the level of mercury control of certain control device configurations based on the chlorine content of the coal fired. EPA developed these curves of best fit in epa_analysis_var.xls, referenced from EPA's CAMR website with a file date of 11/26/03.
3 When EPA did not develop a curve of best fit for the certain control configuration employed by the unit, alpha = 0 and beta = 1 subtract the 97.5% Confidence Interval mercury fraction removed, based on the process control variability calculations (see worksheet 'CI Z Test') The 97.5% removal rate is based on the tested control device Hg removal % (fremove control), except the coal to stack removal (fr.remove coal-stack) was used for units with wet scrubbers (see footnote 10 in ENSR/WEST analysis).
4 Data in the following columns - Heat Content (Btu/lb), Mercury Concentration (ppm), Chlorine Concentration (ppm) - were referenced from Santee Cooper coal samples from shipments received at any of their bituminous coal-fired units in their network so far in 2008. A heating value of 12,500 Btu/lb was assumed for all shipments, to convert from ppm to lb Hg/TBtu.
5 Equations for Fr and E were referenced from WEST Associates, Multivariable Method to Estimate the Mercury Emissions of the Best-Performing Coal-Fired Utility Units Under the Most Adverse Circumstances Which Can Reasonably Be Expected to Recur; prepared by ENSR Corporation, March 4, 2003; Statistical Analysis. This document was cited in the Docket EPA-HQ-OAR-2002-0056-0007[1].pdf.
6 The *Cumulative Frequency* column was calculated and = (the sample number)/(the total sample size)
7 *Index* column simply numbers each coal sample.
8 *Sorted lb Hg/Tbtu* represents the same numbers as under column for 'E', just sorted in ascending order. This was manually done in Excel by copying Column E, then using Data->Sort, for just that column.
9 The *Calculation of 97.5th Percentile* is the re-creation of EPA 97.5th percentile using interpolation of the selected 'E' values that represent the 'Cumulative Frequency' directly above and below 0.975.

Cross 2

Scope: The purpose of the spreadsheet calculations on this tab is to re-create the variability analysis performed by EPA when determining the MACT floor for Mercury Emissions in the Proposed Utility MACT, dated January 30, 2004 (69 FR 4652). This worksheet is formatted to resemble the tables in EPA-HQ-OAR-2002-0056-0006[1].pdf of the Utility MACT Docket. While this unit was not specifically addressed in EPA's variability analysis (EPA only reviewed the top 4 sources before applying variability), this worksheet applies EPA's same analysis by defining a process control variability equation (with values for alpha and beta) and applying this equation to coal samples that could have been combusted by the unit to incorporate fuel variability.

Note: EPA's analysis did not address process control variability for sources where the mercury removal associated with the control configuration utilized could not be attributed to the chlorine content of the coal (see ENSR/WEST Associates Chlorine Algorithms). The analysis shown here includes process control variability through using a value for Beta that represents the 97.5% Confidence Interval mercury removal rate estimated from the individual stack test runs in the ICR-3 database.

Coal Sampling Data from Facility Data				Fuel Variability Calculations		97.5th Percentile Calculations		
Date	Heat Input (Btu/lb)	Mercury Concentration (ppm)	Chlorine Concentration (ppm)	Mercury Removal Fraction, Fr [1, 3] (unitless)	Controlled Mercury Emission Level, E [2] (lb Hg/TBtu)	Cumulative Frequency	Index	Sorted E (lb Hg/Tbtu)
01/07/08	12,500	0.102		0.9322	0.5534	0.006	1	0.1356
01/31/08	12,500	0.089		0.9322	0.4829	0.013	2	0.2658
02/07/08	12,500	0.077		0.9322	0.4178	0.019	3	0.2767
02/14/08	12,500	0.136		0.9322	0.7378	0.026	4	0.2821
02/22/08	12,500	0.141		0.9322	0.7650	0.032	5	0.2984
02/29/08	12,500	0.087		0.9322	0.4720	0.039	6	0.3635
03/14/08	12,500	0.117		0.9322	0.6348	0.045	7	0.3743
05/07/08	12,500	0.089	940	0.9322	0.4829	0.052	8	0.3743
05/14/08	12,500	0.108	872	0.9322	0.5859	0.058	9	0.3960
05/21/08	12,500	0.094	914	0.9322	0.5100	0.065	10	0.4178
05/31/08	12,500	0.108	1,028	0.9322	0.5859	0.071	11	0.4178
06/07/08	12,500	0.103	1,150	0.9322	0.5588	0.078	12	0.4178
06/14/08	12,500	0.112	904	0.9322	0.6076	0.084	13	0.4178
01/07/08	12,500	0.102		0.9322	0.5534	0.091	14	0.4232
01/31/08	12,500	0.091		0.9322	0.4937	0.097	15	0.4286
02/07/08	12,500	0.073		0.9322	0.3960	0.104	16	0.4395
02/14/08	12,500	0.130		0.9322	0.7053	0.110	17	0.4395
02/22/08	12,500	0.117		0.9322	0.6348	0.117	18	0.4449
02/29/08	12,500	0.079		0.9322	0.4286	0.123	19	0.4557
03/14/08	12,500	0.112		0.9322	0.6076	0.130	20	0.4612
03/21/08	12,500	0.124		0.9322	0.6727	0.136	21	0.4612
03/31/08	12,500	0.092		0.9322	0.4991	0.143	22	0.4720
04/07/08	12,500	0.095		0.9322	0.5154	0.149	23	0.4720
04/14/08	12,500	0.099		0.9322	0.5371	0.156	24	0.4774
04/21/08	12,500	0.104		0.9322	0.5642	0.162	25	0.4829
04/30/08	12,500	0.109		0.9322	0.5914	0.169	26	0.4829
05/07/08	12,500	0.107		0.9322	0.5805	0.175	27	0.4829
05/14/08	12,500	0.120		0.9322	0.6510	0.182	28	0.4829
05/21/08	12,500	0.102		0.9322	0.5534	0.188	29	0.4829
05/31/08	12,500	0.130		0.9322	0.7053	0.195	30	0.4883
06/07/08	12,500	0.092		0.9322	0.4991	0.201	31	0.4937
06/14/08	12,500	0.121		0.9322	0.6565	0.208	32	0.4991
01/07/08	12,500	0.135		0.9322	0.7324	0.214	33	0.4991
01/31/08	12,500	0.104		0.9322	0.5642	0.221	34	0.5046
02/07/08	12,500	0.085		0.9322	0.4612	0.227	35	0.5100
02/14/08	12,500	0.134		0.9322	0.7270	0.234	36	0.5154
02/22/08	12,500	0.096		0.9322	0.5208	0.240	37	0.5154
02/29/08	12,500	0.084		0.9322	0.4557	0.247	38	0.5154
03/14/08	12,500	0.115		0.9322	0.6239	0.253	39	0.5208
03/21/08	12,500	0.105		0.9322	0.5697	0.260	40	0.5208
03/31/08	12,500	0.107		0.9322	0.5805	0.266	41	0.5208
04/07/08	12,500	0.112		0.9322	0.6076	0.273	42	0.5208
04/14/08	12,500	0.112		0.9322	0.6076	0.279	43	0.5263
04/21/08	12,500	0.098		0.9322	0.5317	0.286	44	0.5317
04/30/08	12,500	0.111		0.9322	0.6022	0.292	45	0.5317
05/07/08	12,500	0.088		0.9322	0.4774	0.299	46	0.5371
05/14/08	12,500	0.100		0.9322	0.5425	0.305	47	0.5371
05/21/08	12,500	0.102		0.9322	0.5534	0.312	48	0.5425
05/31/08	12,500	0.118		0.9322	0.6402	0.318	49	0.5425
06/07/08	12,500	0.093		0.9322	0.5046	0.325	50	0.5480
06/14/08	12,500	0.142		0.9322	0.7704	0.331	51	0.5480
01/07/08	12,500	0.077		0.9322	0.4178	0.338	52	0.5480
01/31/08	12,500	0.096		0.9322	0.5208	0.344	53	0.5480

02/07/08	12,500	0.077	0.9322	0.4178	0.351	54	0.5534
02/14/08	12,500	0.128	0.9322	0.6944	0.357	55	0.5534
02/21/08	12,500	0.108	0.9322	0.5859	0.364	56	0.5534
02/29/08	12,500	0.108	0.9322	0.5859	0.370	57	0.5534
03/14/08	12,500	0.102	0.9322	0.5534	0.377	58	0.5534
03/21/08	12,500	0.089	0.9322	0.4829	0.383	59	0.5534
03/31/08	12,500	0.121	0.9322	0.6565	0.390	60	0.5534
04/07/08	12,500	0.096	0.9322	0.5208	0.396	61	0.5588
04/14/08	12,500	0.096	0.9322	0.5208	0.403	62	0.5642
04/21/08	12,500	0.111	0.9322	0.6022	0.409	63	0.5642
04/30/08	12,500	0.113	0.9322	0.6131	0.416	64	0.5642
05/07/08	12,500	0.106	0.9322	0.5751	0.422	65	0.5697
05/14/08	12,500	0.110	0.9322	0.5968	0.429	66	0.5751
05/21/08	12,500	0.120	0.9322	0.6510	0.435	67	0.5751
05/31/08	12,500	0.158	0.9322	0.8572	0.442	68	0.5751
06/07/08	12,500	0.106	0.9322	0.5751	0.448	69	0.5805
06/14/08	12,500	0.098	0.9322	0.5317	0.455	70	0.5805
01/07/08	12,500	0.101	0.9322	0.5480	0.461	71	0.5805
01/14/08	12,500	0.123	0.9322	0.6673	0.468	72	0.5805
01/31/08	12,500	0.112	0.9322	0.6076	0.474	73	0.5859
02/07/08	12,500	0.055	0.9322	0.2984	0.481	74	0.5859
02/14/08	12,500	0.117	0.9322	0.6348	0.487	75	0.5859
02/21/08	12,500	0.114	0.9322	0.6185	0.494	76	0.5859
02/29/08	12,500	0.095	0.9322	0.5154	0.500	77	0.5859
03/07/08	12,500	0.121	0.9322	0.6565	0.506	78	0.5859
03/14/08	12,500	0.152	0.9322	0.8247	0.513	79	0.5859
03/21/08	12,500	0.119	0.9322	0.6456	0.519	80	0.5914
03/31/08	12,500	0.108	0.9322	0.5859	0.526	81	0.5914
04/07/08	12,500	0.116	0.9322	0.6293	0.532	82	0.5968
04/14/08	12,500	0.102	0.9322	0.5534	0.539	83	0.6022
04/21/08	12,500	0.101	0.9322	0.5480	0.545	84	0.6022
04/30/08	12,500	0.081	0.9322	0.4395	0.552	85	0.6022
05/07/08	12,500	0.097	0.9322	0.5263	0.558	86	0.6076
05/14/08	12,500	0.069	0.9322	0.3743	0.565	87	0.6076
05/21/08	12,500	0.069	0.9322	0.3743	0.571	88	0.6076
05/31/08	12,500	0.089	0.9322	0.4829	0.578	89	0.6076
06/07/08	12,500	0.095	0.9322	0.5154	0.584	90	0.6076
06/14/08	12,500	0.099	0.9322	0.5371	0.591	91	0.6131
01/07/08	12,500	0.176	0.9322	0.9549	0.597	92	0.6131
01/14/08	12,500	0.052	0.9322	0.2821	0.604	93	0.6185
01/31/08	12,500	0.154	0.9322	0.8355	0.610	94	0.6239
02/07/08	12,500	0.140	0.9322	0.7595	0.617	95	0.6293
02/14/08	12,500	0.128	0.9322	0.6944	0.623	96	0.6348
02/22/08	12,500	0.153	0.9322	0.8301	0.630	97	0.6348
02/29/08	12,500	0.100	0.9322	0.5425	0.636	98	0.6348
03/07/08	12,500	0.132	0.9322	0.7161	0.643	99	0.6402
03/14/08	12,500	0.126	0.9322	0.6836	0.649	100	0.6402
03/21/08	12,500	0.170	0.9322	0.9223	0.656	101	0.6402
03/31/08	12,500	0.106	0.9322	0.5751	0.662	102	0.6456
04/07/08	12,500	0.108	0.9322	0.5859	0.669	103	0.6456
04/14/08	12,500	0.134	0.9322	0.7270	0.675	104	0.6456
04/21/08	12,500	0.118	0.9322	0.6402	0.682	105	0.6456
04/30/08	12,500	0.186	0.9322	1.0091	0.688	106	0.6510
05/07/08	12,500	0.152	0.9322	0.8247	0.695	107	0.6510
05/14/08	12,500	0.146	0.9322	0.7921	0.701	108	0.6565
05/21/08	12,500	0.119	0.9322	0.6456	0.708	109	0.6565
05/31/08	12,500	0.140	0.9322	0.7595	0.714	110	0.6565
06/07/08	12,500	0.128	0.9322	0.6944	0.721	111	0.6673
06/14/08	12,500	0.119	0.9322	0.6456	0.727	112	0.6673
01/07/08	12,500	0.108	0.9322	0.5859	0.734	113	0.6727
01/14/08	12,500	0.049	0.9322	0.2658	0.740	114	0.6836
01/31/08	12,500	0.101	0.9322	0.5480	0.747	115	0.6836
02/07/08	12,500	0.126	0.9322	0.6836	0.753	116	0.6836
02/14/08	12,500	0.154	0.9322	0.8355	0.760	117	0.6944
02/22/08	12,500	0.101	0.9322	0.5480	0.766	118	0.6944
02/29/08	12,500	0.140	0.9322	0.7595	0.773	119	0.6944
03/07/08	12,500	0.111	0.9322	0.6022	0.779	120	0.6944
03/14/08	12,500	0.143	0.9322	0.7758	0.786	121	0.7053
03/21/08	12,500	0.186	0.9322	1.0091	0.792	122	0.7053
03/31/08	12,500	0.119	0.9322	0.6456	0.799	123	0.7053

04/07/08	12,500	0.144	0.9322	0.7812	0.805	124	0.7053
04/14/08	12,500	0.107	0.9322	0.5805	0.812	125	0.7107
04/21/08	12,500	0.128	0.9322	0.6944	0.818	126	0.7161
04/30/08	12,500	0.118	0.9322	0.6402	0.825	127	0.7161
05/07/08	12,500	0.126	0.9322	0.6836	0.831	128	0.7270
05/14/08	12,500	0.140	0.9322	0.7595	0.838	129	0.7270
05/21/08	12,500	0.146	0.9322	0.7921	0.844	130	0.7324
05/31/08	12,500	0.152	0.9322	0.8247	0.851	131	0.7378
06/07/08	12,500	0.131	0.9322	0.7107	0.857	132	0.7595
06/14/08	12,500	0.130	0.9322	0.7053	0.864	133	0.7595
01/07/08	12,500	0.089	0.9322	0.4829	0.870	134	0.7595
01/14/08	12,500	0.025	0.9322	0.1356	0.877	135	0.7595
01/31/08	12,500	0.051	0.9322	0.2767	0.883	136	0.7650
02/07/08	12,500	0.077	0.9322	0.4178	0.890	137	0.7704
02/14/08	12,500	0.087	0.9322	0.4720	0.896	138	0.7758
02/22/08	12,500	0.146	0.9322	0.7921	0.903	139	0.7812
02/29/08	12,500	0.109	0.9322	0.5914	0.909	140	0.7921
03/07/08	12,500	0.132	0.9322	0.7161	0.916	141	0.7921
03/14/08	12,500	0.157	0.9322	0.8518	0.922	142	0.7921
03/21/08	12,500	0.104	0.9322	0.5642	0.929	143	0.8247
03/31/08	12,500	0.102	0.9322	0.5534	0.935	144	0.8247
04/07/08	12,500	0.107	0.9322	0.5805	0.942	145	0.8247
04/14/08	12,500	0.067	0.9322	0.3635	0.948	146	0.8301
04/21/08	12,500	0.081	0.9322	0.4395	0.955	147	0.8355
04/30/08	12,500	0.130	0.9322	0.7053	0.961	148	0.8355
05/07/08	12,500	0.113	0.9322	0.6131	0.968	149	0.8518
05/14/08	12,500	0.078	0.9322	0.4232	0.974	150	0.8572
05/21/08	12,500	0.090	0.9322	0.4883	0.981	151	0.9223
05/31/08	12,500	0.123	0.9322	0.6673	0.987	152	0.9549
06/07/08	12,500	0.082	0.9322	0.4449	0.994	153	1.0091
06/14/08	12,500	0.085	0.9322	0.4612	1.000	154	1.0091

Calculation of 97.5th Percentile

Cumulative Frequency	Index	Sorted E (lb Hg/Tbtu)	97.5th Percentile
0.974	150	0.8572	0.8670
0.981	151	0.9223	

[1] The equation for Fr is as follows: $Fr = 1 - \beta e^{(-\alpha * Cl)}$

where: $\beta = e^{-b}$

$\alpha = a$

a = slope of least-squares fit
b = y-intercept of least-squares fit
Cl = Chlorine concentration, ppm
Fr = fraction of mercury removed during stack test

[2] The equation for E is as follows: $E = \frac{10^6 * Hg(1 - Fr)}{H}$

where: Hg = Mercury concentration, ppm
H = Heat input, Btu/lb
E = Controlled mercury emission level, lb Hg/Tbtu

[3] The following values were used in the Fr equation:
Alpha: 0
Beta: 0.0678

References:

1 Alpha and Beta were referenced from the tab 'Hg Existing & New MACT Limit' in EPA-HQ-OAR-2002-0056-0035(1).xls, which is found in the Utility MACT Docket AOR-2002-0056.
2 Alpha and Beta represent the coefficients in the curve of best fit, developed by EPA to predict the level of mercury control of certain control device configurations based on the chlorine content of the coal fired. EPA developed these curves of best fit in epa_analysis_var.xls, referenced from EPA's CAMR website with a file date of 11/26/03.
3 When EPA did not develop a curve of best fit for the certain control configuration employed by the unit, alpha = 0 and beta = 1 subtract the 97.5% Confidence Interval mercury fraction removed, based on the process control variability calculations (see worksheet 'CI Z Test') The 97.5% removal rate is based on the tested control device Hg removal % (fremove control), except the coal to stack removal (fr.remove coal-stack) was used for units with wet scrubbers (see footnote 10 in ENSR/WEST analysis).
4 Data in the following columns - Heat Content (Btu/lb), Mercury Concentration (ppm), Chlorine Concentration (ppm) - were referenced from Santee Cooper coal samples from shipments received at any of their bituminous coal-fired units in their network so far in 2008. A heating value of 12,500 Btu/lb was assumed for all shipments, to convert from ppm to lb Hg/TBtu.
5 Equations for Fr and E were referenced from WEST Associates, Multivariable Method to Estimate the Mercury Emissions of the Best-Performing Coal-Fired Utility Units Under the Most Adverse Circumstances Which Can Reasonably Be Expected to Recur; prepared by ENSR Corporation, March 4, 2003; Statistical Analysis. This document was cited in the Docket EPA-HQ-OAR-2002-0056-0007[1].pdf.
6 The *Cumulative Frequency* column was calculated and = (the sample number)/(the total sample size)
7 *Index* column simply numbers each coal sample.
8 *Sorted lb Hg/Tbtu* represents the same numbers as under column for 'E', just sorted in ascending order. This was manually done in Excel by copying Column E, then using Data->Sort, for just that column.
9 The *Calculation of 97.5th Percentile* is the re-creation of EPA 97.5th percentile using interpolation of the selected 'E' values that represent the 'Cumulative Frequency' directly above and below 0.975.

The following worksheets, listed below, present calculations for the process control variability component of the Prong 1 approach. This analysis is similar to that described by NACAA in their approach to variability in the 112j Model Rule for Industrial Boilers.

Prong 1 NACAA Process Variability Worksheets:

CI Z test

Site Name	Control Tested	Number of Samples	Uncontrolled Emission Rate (lb/TBtu) [2]	Controlled Emission Rate (lb/TBtu) [1]	Sample Standard Deviation	Controlled Emission Rate Confidence Interval 95%	Controlled Emission Rate Confidence Interval 97.5%	Fraction Removed Confidence Interval 95%	Fraction Removed Confidence Interval 97.5%
Cross 1	ESP/WS	13	8.3877	0.4743	0.3731	1.0881	1.2056	87.03%	85.63%
Cross 2	ESP/WS	19	8.4168	0.3463	0.1145	0.5347	0.5708	93.65%	93.22%

[1] Values based on the average F-factor calculated from the F-factor values on "detail data" tab, for each respective source.

[2] As with EPA's approach, the uncontrolled Hg emissions was back-calculated using the control removal % for units with a single control device (e.g., FF) and was back-calculated using the coal-to-stack removal % for control configurations with a wet scrubber.

The following worksheets, listed below, present calculations for the Prong 2 variability analysis, by similar source based on combining the approaches from EPA in the 2004 proposed Utility MACT and the Dept. of Energy Variability Suggestions. Prong 2 is described in more detail in the Pee Dee Case-by-Case MACT Permit Application.

Prong 2 Worksheets:

P2 Cross 1
P2 Cross 2

Cross 1

Scope: The purpose of the spreadsheet calculations on this tab is to re-create the variability analysis performed by DOE when suggesting a variability approach that could be used in determining the MACT floor for Mercury Emissions in the Proposed Utility MACT (see the DOE report referenced by EPA-HQ-OAR-2002-0056-0019 in the Docket OAR-2002-0056. This worksheet includes a condensed table with formatting similar to the other tables in Prong 1 and the tables in EPA-HQ-OAR-2002-0056-0006[1].pdf of the Utility MACT Docket.

Note: EPA's analysis accounted for fuel variability by basing the floor on the 97.5th percentile worst-case coal shipment in 1999 received by the source being evaluated. The variability calculations outlined here in Prong 2 are consistent with EPA's calculation and selection of the 97.5th percentile coal, but select that 97.5th percentile coal not as the worst-case shipment received by the source in 1999, but as the 97.5th percentile annual average mercury concentration in coal for all sources that submitted bituminous coal data in the ICR-2 database. For further description, refer to the Case-by-Case MACT Permit Application. Process control variability considered in Prong 2 is consistent with EPA's analysis proposed in 2004 in the Utility MACT.

Department of Energy, 97.5th Percentile Analysis [5]

97.5th Percentile Coal from ICR-2 Database			Fuel Variability Calculations	
Heat Input [4] (Btu/lb)	Mercury Concentration [4] (ppm)	Chlorine Concentration [4] (ppm)	Mercury Removal Fraction, Fr [1, 3] (unitless)	Controlled Mercury Emission Level, E [2] (lb Hg/TBtu)
12,500	0.31	1,054	0.9435	1.3944

[1] The equation for Fr is as follows: $Fr = 1 - \beta e^{(-\alpha * Cl)}$

where:
$\beta = e^{-b}$
$\alpha = a$
a = slope of least-squares fit
b = y-intercept of least-squares fit
Cl = Chlorine concentration, ppm
Fr = fraction of mercury removed during stack test

[2] The equation for E is as follows: $E = \frac{10^6 * Hg(1 - Fr)}{H}$

where:
Hg = Mercury concentration, ppm
H = Heat input, Btu/lb
E = Controlled mercury emission level, lb Hg/Tbtu

[3] The following values were used in the Fr equation:
Alpha: 0
Beta: 0.0565

[4] Values taken from the 97.5th percentile annual average Hg concentration in coal for all sites in the ICR-2 database.
The 97.5th percentile annual average coal is from the Niles facility (see the worksheet ' ICR-2 Annual Avg Coal Data')
Mercury concentration calculated from the following value: 24.66 lb/TBtu
Chlorine concentration calculated from the following value: 84.31 lb/BBtu

[5] Based on a variability approach outlined in United States Department of Energy, National Energy Technology Laboratory, Pittsburgh, PA, *Calculation of Possible Mercury MACT Floor Values for Coal-Fired Utilities: Influence of Variability and Approach* . December 2003; Table 4-1 on p.21.

References:

1 Alpha and Beta were referenced from the tab 'Hg Existing & New MACT Limit' in EPA-HQ-OAR-2002-0056-0035(1).xls, which is found in the Utility MACT Docket AOR-2002-0056.
2 Alpha and Beta represent the coefficients in the curve of best fit, developed by EPA to predict the level of mercury control of certain control device configurations based on the chlorine content of the coal fired. EPA developed these curves of best fit in epa_analysis_var.xls, referenced from EPA's CAMR website with a file date of 11/26/03.
3 When EPA did not develop a curve of best fit for the certain control configuration employed by the unit, alpha = 0 and beta = (1 subtract the average mercury fraction removed from facility stack test data compared to the average Hg concentration in coal from weekly coal samples). The mercury removal rate is based on the weekly average stack test emission rate divided by the mercury concentration in the coal sampled for that week, converted to lb/TBtu, and assuming all mercury in the coal would be released as uncontrolled air emissions.
4 Data in the following columns - Mercury Concentration (ppm), Chlorine Concentration (ppm) - were referenced from ICR II annual average concentrations for the 97.5th percentile coal (from the Niles facility). See the worksheet 'ICR-2 Annual Avg Coal Data'. A heating value of 12,500 Btu/lb was assumed for the 97.5th percentile coal, to convert from ppm to lb Hg/TBtu.
5 Equations for Fr and E were referenced from WEST Associates, Multivariable Method to Estimate the Mercury Emissions of the Best-Performing Coal-Fired Utility Units Under the Most Adverse Circumstances Which Can Reasonably Be Expected to Recur; prepared by ENSR Corporation, March 4, 2003; Statistical Analysis. This document was cited in the Docket EPA-HQ-OAR-2002-0056-0007[1].pdf.
6 The *Controlled Mercury Emissions Level, E* is representative of the 97.5th percentile worst-case conditions based on EPA's application of process control variability and DOE's application of fuel variability.

Cross 2

Scope: The purpose of the spreadsheet calculations on this tab is to re-create the variability analysis performed by DOE when suggesting a variability approach that could be used in determining the MACT floor for Mercury Emissions in the Proposed Utility MACT (see the DOE report referenced by EPA-HQ-OAR-2002-0056-0019 in the Docket OAR-2002-0056. This worksheet includes a condensed table with formatting similar to the other tables in Prong 1 and the tables in EPA-HQ-OAR-2002-0056-0006[1].pdf of the Utility MACT Docket.

Note: EPA's analysis accounted for fuel variability by basing the floor on the 97.5th percentile worst-case coal shipment in 1999 received by the source being evaluated. The variability calculations outlined here in Prong 2 are consistent with EPA's calculation and selection of the 97.5th percentile coal, but select that 97.5th percentile coal not as the worst-case shipment received by the source in 1999, but as the 97.5th percentile annual average mercury concentration in coal for all sources that submitted bituminous coal data in the ICR-2 database. For further description, refer to the Case-by-Case MACT Permit Application. Process control variability considered in Prong 2 is consistent with EPA's analysis proposed in 2004 in the Utility MACT.

Department of Energy, 97.5th Percentile Analysis [5]

97.5th Percentile Coal from ICR-2 Database			Fuel Variability Calculations	
Heat Input [4] (Btu/lb)	Mercury Concentration [4] (ppm)	Chlorine Concentration [4] (ppm)	Mercury Removal Fraction, Fr [1, 3] (unitless)	Controlled Mercury Emission Level, E [2] (lb Hg/TBtu)
12,500	0.31	1,054	0.9589	1.0146

[1] The equation for Fr is as follows: $Fr = 1 - \beta e^{(-\alpha * Cl)}$

where:
$\beta = e^{-b}$
$\alpha = a$
a = slope of least-squares fit
b = y-intercept of least-squares fit
Cl = Chlorine concentration, ppm
Fr = fraction of mercury removed during stack test

[2] The equation for E is as follows: $E = \frac{10^6 * Hg(1 - Fr)}{H}$

where:
Hg = Mercury concentration, ppm
H = Heat input, Btu/lb
E = Controlled mercury emission level, lb Hg/Tbtu

[3] The following values were used in the Fr equation:
Alpha: 0
Beta: 0.0411

[4] Values taken from the 97.5th percentile annual average Hg concentration in coal for all sites in the ICR-2 database.
The 97.5th percentile annual average coal is from the Niles facility (see the worksheet ' ICR-2 Annual Avg Coal Data')
Mercury concentration calculated from the following value: 24.66 lb/TBtu
Chlorine concentration calculated from the following value: 84.31 lb/BBtu

[5] Based on a variability approach outlined in United States Department of Energy, National Energy Technology Laboratory, Pittsburgh, PA, *Calculation of Possible Mercury MACT Floor Values for Coal-Fired Utilities: Influence of Variability and Approach* . December 2003; Table 4-1 on p.21.

References:

1 Alpha and Beta were referenced from the tab 'Hg Existing & New MACT Limit' in EPA-HQ-OAR-2002-0056-0035(1).xls, which is found in the Utility MACT Docket AOR-2002-0056.
2 Alpha and Beta represent the coefficients in the curve of best fit, developed by EPA to predict the level of mercury control of certain control device configurations based on the chlorine content of the coal fired. EPA developed these curves of best fit in epa_analysis_var.xls, referenced from EPA's CAMR website with a file date of 11/26/03.
3 When EPA did not develop a curve of best fit for the certain control configuration employed by the unit, alpha = 0 and beta = (1 subtract the average mercury fraction removed from facility stack test data compared to the average Hg concentration in coal from weekly coal samples). The mercury removal rate is based on the weekly average stack test emission rate divided by the mercury concentration in the coal sampled for that week, converted to lb/TBtu, and assuming all mercury in the coal would be released as uncontrolled air emissions.
4 Data in the following columns - Mercury Concentration (ppm), Chlorine Concentration (ppm) - were referenced from ICR II annual average concentrations for the 97.5th percentile coal (from the Niles facility). See the worksheet 'ICR-2 Annual Avg Coal Data'. A heating value of 12,500 Btu/lb was assumed for the 97.5th percentile coal, to convert from ppm to lb Hg/TBtu.
5 Equations for Fr and E were referenced from WEST Associates, Multivariable Method to Estimate the Mercury Emissions of the Best-Performing Coal-Fired Utility Units Under the Most Adverse Circumstances Which Can Reasonably Be Expected to Recur; prepared by ENSR Corporation, March 4, 2003; Statistical Analysis. This document was cited in the Docket EPA-HQ-OAR-2002-0056-0007[1].pdf.
6 The *Controlled Mercury Emissions Level, E* is representative of the 97.5th percentile worst-case conditions based on EPA's application of process control variability and DOE's application of fuel variability.

The following worksheets, listed below, present summarized facility data, used in the variability calculations for the respective sources.

Facility Data Worksheets:

Cross 1 Data
Cross 2 Data
Santee Coal Data

Cross 1 Weekly Average CEMS data and Corresponding Coal Samples

Week	CEMS Weekly Avg Hg Emissions BAF-adjusted (ug/m3)[3]	Weekly Avg Flow (scfh)	Weekly Coal Burned (Tons)	Weekly Avg Hg Emissions (lb/Tbtu)[1]	Coal Mercury Concentration (ppb, ar)	Coal Heating Value (Btu/lb, ar)[2]	Uncontrolled Hg Emissions (lb/Tbtu)
1/7/2008	0.0264	116,603,479	36,961	0.1408	102	12,500	8.16
1/31/2008	0.2151	120,115,916	52,441	0.2836	89	12,500	7.12
2/7/2008	0.0336	115,081,880	34,128	0.1607	77	12,500	6.16
2/14/2008	0.0335	116,706,661	35,526	0.1565	136	12,500	10.88
2/22/2008	0.2373	118,838,137	35,966	0.4399	141	12,500	11.28
2/29/2008	0.4187	118,865,371	41,646	0.5971	87	12,500	6.96
3/14/2008	0.8908	115,889,311	36,094	1.3076	117	12,500	9.36
5/7/2008	0.6965	106,334,263	31,596	1.0962	89	12,500	7.12
5/14/2008	0.3328	107,487,347	31,231	0.5960	108	12,500	8.64
5/21/2008	0.4209	112,247,535	36,228	0.6511	94	12,500	7.52
5/31/2008	0.1586	107,090,471	35,640	0.3007	108	12,500	8.64
6/7/2008	0.1605	111,030,157	35,675	0.3140	103	12,500	8.24
6/14/2008	0.0114	113,663,140	35,825	0.1217	112	12,500	8.96
			Averages:	*0.4743*	*104.8*		*8.3877*

ug/lb	4.54E+08
cf/cm	35.31467
J/Btu	1055.056
Uncontrolled Hg Emissions (lb/TBtu)	8.39
Coal-to-Stack Removal	0.9435

1. Includes 0.08 ug/m3 particulate-bound Hg not measured by CEMS.
   Based on average Hg^{PM} speciation from Cross 3 Ontario-Hydro stack test performed by URS on April 16 and 18, 2008.
2. Assumed 12,500 Btu/lb for the coal since did not have corresponding heating values of as-fired samples.
3. BAF = bias adjustment factor of 2.91. Represents adjustment to raw CEMS data based on RATA. Determined in accordance with Part 75 procedures. Includes CEMS data with zeroes.

Cross 2 Weekly Average CEMS data and Corresponding Coal Samples

Week	CEMS Weekly Avg Hg Emissions No BAF (ug/m3)[3]	Weekly Avg Flow (scfh)	Weekly Coal Burned (Tons)	Weekly Avg Hg Emissions (lb/Tbtu)[1]	Coal Mercury Concentration (ppb, ar)	Coal Heating Value (Btu/lb, ar)[2]	Uncontrolled Hg Emissions (lb/Tbtu)
1/7/2008	0.1719	104,654,215	38,730	0.2855	102	12,500	8.16
1/31/2008	0.2152	103,484,759	53,867	0.2379	91	12,500	7.28
2/7/2008	0.1040	101,757,937	36,769	0.2136	73	12,500	5.84
2/14/2008	0.2470	103,460,187	36,822	0.3855	130	12,500	10.4
2/22/2008	0.4258	105,229,698	41,608	0.5367	117	12,500	9.36
2/29/2008	0.2488	107,010,736	37,620	0.3924	79	12,500	6.32
3/14/2008	0.3733	105,263,237	37,009	0.5408	112	12,500	8.96
3/21/2008	0.2053	105,713,175	36,124	0.3503	124	12,500	9.92
3/31/2008	0.2032	105,256,947	52,409	0.2387	92	12,500	7.36
4/7/2008	0.2586	95,197,573	23,221	0.5823	95	12,500	7.6
4/14/2008	0.1795	103,450,920	35,941	0.3134	99	12,500	7.92
4/21/2008	0.2682	100,561,149	30,211	0.4862	104	12,500	8.32
4/30/2008	0.2043	104,278,318	47,503	0.2618	109	12,500	8.72
5/7/2008	0.1380	101,260,292	33,682	0.2750	107	12,500	8.56
5/14/2008	0.2014	102,279,841	34,776	0.3472	120	12,500	9.6
5/21/2008	0.1627	99,689,469	35,357	0.2871	102	12,500	8.16
5/31/2008	0.1601	99,447,291	47,819	0.2095	130	12,500	10.4
6/7/2008	0.1612	102,380,873	35,408	0.2926	92	12,500	7.36
6/14/2008	0.1905	102,064,092	33,684	0.3438	121	12,500	9.68
			Averages:	*0.3463*	*105.2*		*8.4168*

ug/lb	4.54E+08
cf/cm	35.31467
J/Btu	1055.056
Uncontrolled Hg Emissions (lb/TBtu)	8.42
Coal-to-Stack Removal	0.9589

1. Includes 0.08 ug/m3 particulate-bound Hg not measured by CEMS.
   Based on average Hg^{PM} speciation from Cross 3 Ontario-Hydro stack test performed by URS on April 16 and 18, 2008.
2. Assumed 12,500 Btu/lb for the coal since did not have corresponding heating values of as-fired samples.
3. No adjustments made to monitored CEMS values because RATA demonstrated monitored values were close to reference method.
   Includes CEMS data with valid zeroes.

Mercury Data from Coal Samples for Shipments Received at Santee Cooper Facilities in 2008

Date	Facility	Car	Hg (ppb)	Cl (ppm)
01/07/08	Cross 1	AB00094	102	
01/31/08	Cross 1	AB00696	89	
02/07/08	Cross 1	AB00916	77	
02/14/08	Cross 1	AB01107	136	
02/22/08	Cross 1	AB01328	141	
02/29/08	Cross 1	AB01698	87	
03/14/08	Cross 1	AB02158	117	
05/07/08	Cross 1	AB03693	89	940
05/14/08	Cross 1	AB03860	108	872
05/21/08	Cross 1	AB04048	94	914
05/31/08	Cross 1	AB04253	108	1028
06/07/08	Cross 1	AB04437	103	1150
06/14/08	Cross 1	AB04700	112	904
01/07/08	Cross 2	AB00095	102	
01/31/08	Cross 2	AB00697	91	
02/07/08	Cross 2	AB00917	73	
02/14/08	Cross 2	AB01108	130	
02/22/08	Cross 2	AB01329	117	
02/29/08	Cross 2	AB01699	79	
03/14/08	Cross 2	AB02159	112	
03/21/08	Cross 2	AB02356	124	
03/31/08	Cross 2	AB02600	92	
04/07/08	Cross 2	AB02813	95	
04/14/08	Cross 2	AB03018	99	
04/21/08	Cross 2	AB03216	104	
04/30/08	Cross 2	AB03537	109	
05/07/08	Cross 2	AB03694	107	
05/14/08	Cross 2	AB03861	120	
05/21/08	Cross 2	AB04049	102	
05/31/08	Cross 2	AB04254	130	
06/07/08	Cross 2	AB04438	92	
06/14/08	Cross 2	AB04701	121	
01/07/08	Cross 3	AB00096	135	
01/31/08	Cross 3	AB00698	104	
02/07/08	Cross 3	AB00918	85	
02/14/08	Cross 3	AB01109	134	
02/22/08	Cross 3	AB01330	96	
02/29/08	Cross 3	AB01700	84	
03/14/08	Cross 3	AB02160	115	
03/21/08	Cross 3	AB02357	105	
03/31/08	Cross 3	AB02601	107	
04/07/08	Cross 3	AB02814	112	
04/14/08	Cross 3	AB03019	112	
04/21/08	Cross 3	AB03217	98	
04/30/08	Cross 3	AB03538	111	
05/07/08	Cross 3	AB03695	88	
05/14/08	Cross 3	AB03862	100	

Mercury Data from Coal Samples for Shipments Received at Santee Cooper Facilities in 2008

Date	Facility	Car	Hg (ppb)	Cl (ppm)
05/21/08	Cross 3	AB04050	102	
05/31/08	Cross 3	AB04255	118	
06/07/08	Cross 3	AB04439	93	
06/14/08	Cross 3	AB04702	142	
01/07/08	GGS Units 1/2	AB00120	77	
01/31/08	GGS Units 1/2	AB00732	96	
02/07/08	GGS Units 1/2	AB01018	77	
02/14/08	GGS Units 1/2	AB01168	128	
02/21/08	GGS Units 1/2	AB01423	108	
02/29/08	GGS Units 1/2	AB01697	108	
03/14/08	GGS Units 1/2	AB02197	102	
03/21/08	GGS Units 1/2	AB02379	89	
03/31/08	GGS Units 1/2	AB02629	121	
04/07/08	GGS Units 1/2	AB02856	96	
04/14/08	GGS Units 1/2	AB03052	96	
04/21/08	GGS Units 1/2	AB03250	111	
04/30/08	GGS Units 1/2	AB03554	113	
05/07/08	GGS Units 1/2	AB03720	106	
05/14/08	GGS Units 1/2	AB03911	110	
05/21/08	GGS Units 1/2	AB04080	120	
05/31/08	GGS Units 1/2	AB04303	158	
06/07/08	GGS Units 1/2	AB04476	106	
06/14/08	GGS Units 1/2	AB04734	98	
01/07/08	JGS Units 3/4	AB00089	101	
01/14/08	JGS Units 3/4	AB00249	123	
01/31/08	JGS Units 3/4	AB00666	112	
02/07/08	JGS Units 3/4	AB00915	55	
02/14/08	JGS Units 3/4	AB01048	117	
02/21/08	JGS Units 3/4	AB01297	114	
02/29/08	JGS Units 3/4	AB01618	95	
03/07/08	JGS Units 3/4	AB01829	121	
03/14/08	JGS Units 3/4	AB02079	152	
03/21/08	JGS Units 3/4	AB02398	119	
03/31/08	JGS Units 3/4	AB02576	108	
04/07/08	JGS Units 3/4	AB02762	116	
04/14/08	JGS Units 3/4	AB02974	102	
04/21/08	JGS Units 3/4	AB03172	101	
04/30/08	JGS Units 3/4	AB03531	81	
05/07/08	JGS Units 3/4	AB03689	97	
05/14/08	JGS Units 3/4	AB03823	69	
05/21/08	JGS Units 3/4	AB04007	69	
05/31/08	JGS Units 3/4	AB04252	89	
06/07/08	JGS Units 3/4	AB04436	95	
06/14/08	JGS Units 3/4	AB04704	99	
01/07/08	WGS Unit 1	AB00086	176	
01/14/08	WGS Unit 1	AB00250	52	
01/31/08	WGS Unit 1	AB00693	154	

Mercury Data from Coal Samples for Shipments Received at Santee Cooper Facilities in 2008

Date	Facility	Car	Hg (ppb)	Cl (ppm)
02/07/08	WGS Unit 1	AB00912	140	
02/14/08	WGS Unit 1	AB01165	128	
02/22/08	WGS Unit 1	AB01331	153	
02/29/08	WGS Unit 1	AB01669	100	
03/07/08	WGS Unit 1	AB01894	132	
03/14/08	WGS Unit 1	AB02155	126	
03/21/08	WGS Unit 1	AB02376	170	
03/31/08	WGS Unit 1	AB02573	106	
04/07/08	WGS Unit 1	AB02801	108	
04/14/08	WGS Unit 1	AB03020	134	
04/21/08	WGS Unit 1	AB03209	118	
04/30/08	WGS Unit 1	AB03532	186	
05/07/08	WGS Unit 1	AB03690	152	
05/14/08	WGS Unit 1	AB03857	146	
05/21/08	WGS Unit 1	AB04045	119	
05/31/08	WGS Unit 1	AB04304	140	
06/07/08	WGS Unit 1	AB04477	128	
06/14/08	WGS Unit 1	AB04724	119	
01/07/08	WGS Unit 2	AB00087	108	
01/14/08	WGS Unit 2	AB00251	49	
01/31/08	WGS Unit 2	AB00694	101	
02/07/08	WGS Unit 2	AB00913	126	
02/14/08	WGS Unit 2	AB01166	154	
02/22/08	WGS Unit 2	AB01332	101	
02/29/08	WGS Unit 2	AB01670	140	
03/07/08	WGS Unit 2	AB01895	111	
03/14/08	WGS Unit 2	AB02156	143	
03/21/08	WGS Unit 2	AB02377	186	
03/31/08	WGS Unit 2	AB02574	119	
04/07/08	WGS Unit 2	AB02802	144	
04/14/08	WGS Unit 2	AB03021	107	
04/21/08	WGS Unit 2	AB03210	128	
04/30/08	WGS Unit 2	AB03533	118	
05/07/08	WGS Unit 2	AB03691	126	
05/14/08	WGS Unit 2	AB03858	140	
05/21/08	WGS Unit 2	AB04046	146	
05/31/08	WGS Unit 2	AB04305	152	
06/07/08	WGS Unit 2	AB04478	131	
06/14/08	WGS Unit 2	AB04725	130	
01/07/08	WGS Units 3/4	AB00088	89	
01/14/08	WGS Units 3/4	AB00252	25	
01/31/08	WGS Units 3/4	AB00695	51	
02/07/08	WGS Units 3/4	AB00914	77	
02/14/08	WGS Units 3/4	AB01167	87	
02/22/08	WGS Units 3/4	AB01333	146	
02/29/08	WGS Units 3/4	AB01671	109	
03/07/08	WGS Units 3/4	AB01896	132	

Mercury Data from Coal Samples for Shipments Received at Santee Cooper Facilities in 2008

Date	Facility	Car	Hg (ppb)	Cl (ppm)
03/14/08	WGS Units 3/4	AB02157	157	
03/21/08	WGS Units 3/4	AB02378	104	
03/31/08	WGS Units 3/4	AB02575	102	
04/07/08	WGS Units 3/4	AB02803	107	
04/14/08	WGS Units 3/4	AB03022	67	
04/21/08	WGS Units 3/4	AB03211	81	
04/30/08	WGS Units 3/4	AB03534	130	
05/07/08	WGS Units 3/4	AB03692	113	
05/14/08	WGS Units 3/4	AB03859	78	
05/21/08	WGS Units 3/4	AB04047	90	
05/31/08	WGS Units 3/4	AB04306	123	
06/07/08	WGS Units 3/4	AB04479	82	
06/14/08	WGS Units 3/4	AB04726	85	